



548206

**United States Environmental Protection Agency  
Region 5**

**To: Shari Kolak**  
**From: Amy Gahala**  
**Date: 02/05/2016**  
**Subject: Lake Calumet Monitoring well locations Evaluation**

Shari, I have reviewed the above subject line and below are my comments for your consideration.

The purpose of the VAP/HPT investigation was to determine what contaminants were site related versus offsite (landfill) related. Areas with concentrations above screening levels will need to be further investigated. Therefore, I would recommend installing monitoring wells at or near the HPT locations with the highest benzene and/or ammonia. This is what will be needed as a first step to understanding the highest concentrations entering and exiting the perimeter of the site.

ARCADIS proposed a number of general (vague) locations that I suppose they are waiting for our recommendation to help them identify exactly where. They propose two wells in the northeast corner. I propose HPT04 and HPT-05.

ARCADIS proposed two wells in the southeast corner, but again were vague with the exact locations. The HPT locations with the highest ammonia concentrations were HPT-14, HPT-13, HPT11, and HPT10a. If we prioritize these locations based on hydraulic conductivity and groundwater flow direction, then the well locations should be placed at HPT-11, HPT-13m HPT-14. There were no high levels of benzene in the southeast corner.

ARCADIS proposed a well long the southern end of the site near HPT-16 and HPT-17. Ammonia is elevated at HPT-15 and HPT-19. Therefore, these should be added.

ARCADIS proposed three wells along the western edge at HPT-18, HPT-22 and HPT-01. I concur. These wells had elevated ammonia and Benzene.

ARCADIS proposed a well near HPT -20, but there was not water found at this well and therefore no ammonia or benzene results. HPT-21 is a better option as that one had both ammonia and benzene (and water).

Eleven wells and specific locations recommended are:

<b>WELL Location</b>	<b>Highest Benzene Concentration (mg/L)</b>	<b>Highest Ammonia Concentration (mg/L)</b>
HPT-04	140	45
HPT-05	330	30
HPT-11	18	790
HPT-13	22	870
HPT-14	21	520
HPT-15	11	140
HPT-19	2.8	56
HPT-18	130	120
HPT-22	110	460
HPT-01	86J	98
HPT-21	15	75

**Other Notes:**

I don't know the details of the PZ wells or depths, but the data presented in the groundwater map and flow figure on page 4 indicates some interesting hydrology. There is a strong upwards vertical gradient at PZ-10 S/D with a 100 foot difference in water level where the deep water is 100 feet higher than the shallow aquifer. Other nested PZ show a much smaller difference. PZ-8 S/D is has only a 0.10 ft difference (or a 10.10 ft difference—the resolution on slide 4 is poor) and PZ-6 S/D is a 0.36 difference. PZ-7 S/D have a 0.06 difference with the deep water level above the shallow. This means that the deeper water is flowing upwards into the shallower aquifer and the flow rate may be significant based on the large difference at PZ-10. However, the resolution is poor, and I don't have the well details. But I am just pointing out that the vertical flow in this area may have an important role in flow directions and contaminant distribution.

The hydraulic conductivities indicate locations at the northwest end appear to have the higher hydraulic conductivities in the deeper portion of the HPT. The hydraulic conductivities become higher in the shallower portion of the HPT at the eastern and southern edges of the Site. The influence of this hydraulic distribution of vertical flow may need to be considered when making interpretation regarding sources of the contamination and flow characteristics.

If you have any questions, please contact me.

Sincerely,

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